EPA comments to the BHHRA Interim Deliverable
Columbia Falls Aluminum Company NPL Site
Columbia Falls, Montana
August 30, 2018

1) Selection of COPCs for Biota (Page 2) – Clarify the text to indicate the target cancer risk for derivation of screening values (global comment).

2) Selection of COPCs for Biota Equation 1 - C_{fish} (Page 3) - Please indicate if Cfish predicted using equation 1 is in wet weight or dry weight. Correct the units for Csw to be µg/L not µ/L.

3) Exposure Assessment Exposure Point Concentrations (Page 3) – Please clarify how the 95 upper confidence limit (95UCL) on the mean will "account for the uncertainty in EPCs for Reasonable Maximum Exposure (RME and Central Tendency Exposure (CTE) if applicable". The exposure point concentration (EPC) used for reasonable maximum exposure (RME) and central tendency exposure (CTE) risk estimates should be equal, it is the exposure parameters (e.g., an exposure frequency of 10 days/year versus 5 days/year) that vary between RME and CTE.

4) Exposure Assessment Exposure Point Concentrations (Page 3) – If the 95UCL on the mean exceeds the maximum detected concentration for a chemical of potential concern (COPC), the 95UCL on the mean should be selected as the EPC per EPA's ProUCL Technical Guide (EPA 2015).

5) Exposure Assessment Exposure Point Concentrations – Fugitive Dust Generation (Page 4) – Rather than rely upon an all-terrain (ATV) particulate emission factor (PEF) study from Michigan, it is recommended that an ATV activity-based sampling (ABS) study from Colorado be used as it would be more representative of Site conditions. The ATV ABS data collected at the Nelson Tunnel Superfund Site data that can be used to generate a PEF, these data can be provided by EPA.

6) Game Tissue (Page 5) – While it is recognized that deer and cattle will have differing physiology and fat content, the incorporation of a beef biotransfer factor in the main risk characterization assumes that contaminants are contained within the lipids of meat that is prepared for consumption. This factor would be more appropriate to include in discussing the uncertainty associated with risks estimated for this pathway while demonstrating the partitioning of contaminants into various tissue types.

7) Exposure Equations and Assumptions (Page 7) – Below are comments on the exposure parameters provided in Table 4-1 through 4-5 and as discussed in the text. Comments are meant to be global comments that apply to all tables unless otherwise specified.

    a. Please clarify that these are RME-based exposure parameters.

    b. If CTE risk estimates are desired to be presented in the human health risk assessment (HHRA), please also provide the CTE-based exposure parameters.

c. For receptors that will have risk summed for cancer risk characterization (e.g., the resident), present the time-weighted average calculation methodology.

d. The body weight for the adolescent should be 44 kilograms. This is based on Exposure Factors Handbook (EPA 2011), Table 8-1 (age-weighted average based on body weights for ages 6-<11 years old and 11-<16 years old).

e. Discussion of and equations for evaluating chemicals with a mutagenic mode of action should be added.

f. The construction worker and industrial should have an exposure frequency of 188 days per year for soil-related exposure pathways. This is based on the assumed snow coverage of 75% of the year with the default exposure frequency of 250 days per year as indicated in OSWER Directive 9200.1-120 (EPA 2014).

g. The exposure frequency of 1 day per month for an ATV rider is very low for RME. It is suggested this value be retained for CTE evaluated as needed and a value of 2 days per month be used for RME.

h. The exposure frequency for an adolescent trespasser of 7 days per year is very low for RME considering potential future use of the Site. It is suggested this value be retained for CTE evaluated as needed and a value of 14 days be used for RME.

i. Particulate emission factors presented in the tables for receptors other than ATV riders require additional explanation in the text. The citation provided for the value is "MDEQ 2017". Per the references section this is *Circular DEQ-7 Montana Numerical Water Quality Standards* which does not appear to be correct. Rationale should be provided as to why the industrial worker, stormwater management worker, hunter, floater, fisher, resident, and trespasser have the same PEF value as the construction worker when it can be presumed that the level of surficial disturbance and subsequent dust releases for the latter receptor is greater. As noted above, the PEF value for the ATV rider should be revised to be more representative of the mountain west, rather than Michigan.

j. Tables 4-3 and 4-4 have several formulas that are returning "#Ref!", please correct as necessary.

k. The fish ingestion rate in Table 4-5 appears to be more representative of CTE receptors. It is suggested this value be retained for CTE evaluated as needed and a value of 43 grams/day be used for RME. This value is based on the 95th percentile ingestion rates presented in Exposure Factors Handbook (EPA 2011) for freshwater recreational fish intake by consuming anglers in North Dakota (nearest state to Montana with data).

8) Table 5-1 – The target organs for antimony for oral/dermal should be hematologic (longevity, blood glucose, and cholesterol).

9) Table 5-1 - The target organs for barium for oral/dermal should be urinary.

10) Table 5-1 - The target organs for selenium for oral/dermal should be nervous, hematologic, dermal.

11) Table 5-2 – The target organs for arsenic for inhalation should be reproductive/ development; cardiovascular system; nervous system; lung; skin.

12) Table 6-1 and Table 6-2 – Please add indication of those chemicals that are mutagens.

References submitted with comments

EPA. 2011. *Exposure Factors Handbook: 2011 Edition.* October.

EPA. 2014. *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factor.* OSWER Directive 9200.1-120. February 6.

EPA. 2015. ProUCL Version 5.1 Technical Guide. EPA/600/R-07/041. October.